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DOING FOR AN HEREDITARY NOBLEMAN.

It would be to nourish a false hope among our more democratic readers, and to excite an unjustifiable interest in all, were we to pretend that the title of this paper literally signifies its contents. It is very difficult to do away with an hereditary nobleman in this country—though political convulsions—such as the first French Revolution—sometimes offer opportunities for it abroad, on a truly magnificent scale; the feat is not performed in England oftener than the agave is said to bloom—that is, about once in a century; though there have been exceptionally favourable epochs for its performance—especially in the days of the Stuarts and Tudors—which have not been let slip. In America, the exploit is impossible. Since the actual occurrence, then, is so rare, even the attempt at it—the so far successful inception of the undertaking, as the being given in charge to the police on account of it—must have a proportional importance, and it is for that reason that the following personal experience of one who was accused of embruining his hands in noble blood is penned.

Hitherto, the grandeur of our subject has permitted, if not compelled us to use the first person plural; kings and queens may find it easy to do so, for use they say is second nature; but with me, who have never been a king, nor even an editor, I confess I find it difficult. It may arise from egotism, but whenever I begin a note in the third person, I am certain to recur to the first person singular before I have finished with it, and as I know I shall do so before I have written half-a-dozen sentences of the following narrative, I may as well commence with it at once.

I am an actor, not unknown to fame. If you are a playgoer, you must have often been convulsed by my efforts to amuse you in low comedy; and, on the other hand, in certain old plays of merit, you must have admired my 'nice conduct of a clouded cane,' and the exquisite air with which I have taken snuff, and afterwards brushed the

superfluity from my lace ruffles. My enemies—which comprise nineteen-twentieths of the members of the metropolitan stage, that being about the proportion of male actors who are my acknowledged inferiors—assert that I am most endurable in the former rôle; in short, that I am a born buffoon; the general public, including all the ladies of the stage, consider me, I fancy, most inimitable as a nobleman of Charles II.'s era. But, for my own part, I hardly know in which character I acquit myself most creditably. I like myself best in that in which I happen at the moment to be playing.

'Blathers,' say I to myself sometimes, in uncontrollable admiration, 'what an excellent make-up is your Tom Tiddler; what a snob you look, what a fool you are; how natural is your impersonation of that silly cad!' And then again, when I have been playing Lord Fribble, 'Blathers,' say I, 'can that be you! What a becoming attire, what easy elegance, what confidence in your hereditary importance—it is no wonder that you obtain such victories over the gentler sex.' I try to be fair in my judgment of myself, but 'stap my vitals' (which is Lord Fribble's expression, not mine), I really do not know to which of my two selves to award the palm; I must leave it to the public and the ladies.

In private life, away from the stage, I have the good fortune to be modest and unassuming, which renders me a general favourite. 'Blathers is always a gentleman,' has become a proverb; and on that account, I am more often requested to play a part in amateur theatricals—among very great people indeed—than perhaps any other individual (male) of my very liberal profession. It is a pity that amateurs should attempt to act at all. That famous criticism of Macready's, upon a company of such persons, which was extorted from him by the importunities of the stage-manager at a country-house, who entreated him to tell him which actor he liked best, always recurs to me when I think of them.

'Well, sir, since you *will* have it—I liked your prompter best, because I heard most of him, and saw least of him.'

I suppose, however, there will always be amateur actors, just as there are county magistrates; though it is the universal experience, that that which is done for nothing is worth just what it is done for. Of course, when I am asked to give my assistance to such persons, I am duly remunerated for my trouble; but the sufferings which I endure, from a professional point of view—the mangling done which I have to witness—can never be atoned for by pounds sterling. The supper, however, is generally excellent, and I am always treated with the respect to which my superiority entitles me.

What is most trying to me in my amateur connection is, when I am requested to play a secondary part to some unfortunate gentleman who considers himself qualified by nature to play the first part. For this, I need not say, I exact a double fee, but the wear and tear of my feelings is more than proportionally severe. The character that is most affected by these deluded persons is that of Sir Charles Coldstream in *Used Up*. Military men, in particular, who have cultivated an impassive manner and a drawing voice, are prone to imagine themselves fitted for this performance, which requires, at one stage of it, all the energy and passion of a Charles Matthews or a Blathers, and many a twenty-pound note have I had for playing the Blacksmith to a very, very sad caricature of that pleasant baronet. I was asked to do so, down at a certain great mansion at Richmond, last Easter. At first, I positively declined, upon the plea that I was drawing large houses as Lord Fribble in my own theatre, and could not be excused even for a single night; but the following letter persuaded me to accede to the request.

MY DEAR BLATHERS—You *must* come; for there is no man in England I can *trust* to play the Blacksmith to my Sir Charles except yourself. As for your theatre, that is easily managed; your Lord Fribble is over by ten o'clock; then jump into a cab, and catch the 10.30 to Richmond. *Used Up* will be made our last piece expressly to suit this arrangement, and you can change your costume in the cab or the train. I inclose a cheque for five-and-twenty pounds, lest in my hurry and excitement on the night I should chance to forget it.—Yours ever,
PLANTAGENET.

The captain, you observe, was a lord, which had its weight with me as a true-born Briton; and, moreover, when one has got money in one's hand, it goes greatly against the grain—or, at least, *my* grain—to return it. As to dressing in the train, that was not to be thought of; for only imagine if there should be no compartment without a lady in it! But to devote the half-hour I had to get to the station to dressing seemed feasible enough; and indeed, without some such arrangement, it was certain I could never appear on the Richmond boards by eleven o'clock. It was true that the piece in which I played Lord Fribble was generally concluded by ten; but a few more minutes had to be allowed for in my case, since I always had to come forward to acknowledge the calls from behind the curtain. Of course I might have omitted to do this, but no earthly considerations—or, at all events, no considerations with respect to an amateur performance at Richmond—would have induced Alphonso Blathers to commit such a discourtesy.

At 10.5, then, on the night in question I hurried from the theatre in the splendid attire of Lord Fribble, and jumped into the cab that was at the door in readiness for me, while an attendant placed a carpet-bag by my side, containing the costume of the Blacksmith. Hurried as I was, I could not help observing, with a smile, the wide-mouthed admiration of the cabman, and receiving with satisfaction the compliment extorted from his lips by my superb appearance: 'My eye! an hereditary nobleman!' Why 'hereditary,' it was difficult to say, but since he was an Irishman, it would obviously have been useless to ask his reason for using that term, or any other. Perhaps it was his artless method of conveying a supreme sense of my distinguished quality, and as such I had certainly no fault to find with it. At all events, there was not a moment to spare in satisfying such curiosity. 'Drive quick, sirrah,' were my last words; and 'I'll make 'em spin, my lord' (in allusion, probably, to the wheels), was the obsequious reply.

Independently of the mental confusion incident, in one of a modest and retiring nature, to dressing in a cab, the uncomfortable idea (not wholly unjustified by the fact) that persons on both sides of the street can perceive the whole proceeding—independently, I say, of what I may call moral considerations, it is an exceedingly difficult thing to do. To have exchanged the Blacksmith's suit for the lord's, to have put in all the pins, and frills, and gewgaws, while exposed to that ceaseless jolting and the observation of ten thousand pair of eyes, would indeed have been impossible; and even as it was, I took twice the time that I should have taken in my own dressing-room at the theatre to accomplish my object. My periwig was still upon my head, though my Blacksmith's clothes were on my body, when I passed through Waterloo Bridge turnpike; and never, probably, had the tollman betrayed so much astonishment during his official duties as at the moment when he received my twopence. But the next moment, I had thrust it into the carpet-bag, with the rest of my fine attire, and became, with the help of a little lamp-black, as genuine a son of the anvil as any man whose carriage has broken down on a country road would wish to see. For an instant, the humorous idea did cross my mind, that perhaps the railway clerk would hesitate to give me a first-class ticket; but the clock in the Waterloo Road shewed but five minutes to the half-hour, and all my thoughts were concentrated upon the question of whether I should reach the station in time. I did reach it in time, though with a minute or two only to spare; and jumping out upon the platform, held out my hand, with half-a-crown in it, to the cabman. It is always my custom to pay such persons liberally, and at first I thought his astonishment was due to the magnitude of the sum thus offered to his notice. His eyes became of the size of saucers, his mouth approached the dimensions of a punch-bowl rather than those of a slop-basin.

'None of your blood-money!' cried he. 'O mother of Moses! here's a villain been and murdered an hereditary nobleman! Police, police!' At that fatal cry, the porters, who, I must say, had not shewn themselves very alert to take my carpet-bag, began to gather round me, and at the same time an inspector shewed himself at the ticket-office door. 'That man is mad,' said I, addressing

this official. 'I have given him his fare, and sixpence over, and he won't take it.' But the cabman had by this time swung himself off his perch. 'He has murdered an hereditary nobleman,' was that idiot's reiterated cry, which being taken up by the porters, the passengers, the passers-by, presently swelled into a tempest of accusation. It was in vain for me, in my Blacksmith's garb, to offer a syllable of denial. My accuser was evidently actuated by a genuine sense of public justice; and the fact of my having come in a cab at all seemed doubtless, of itself, to demand an explanation. If I had only had my hammer, I do believe that, in my indignation and chagrin, I should have been tempted to make use of it; but, fortunately, I was quite unarmed, save for the dress-sword of my Lord Fribble, which the cabman had already possessed himself of, and was holding up to the excited spectators, as the weapon, I suppose, where-with the bloody deed with which I was charged had been accomplished. While I was thus in custody, the doors were closed, the bell was rung, and my train started off to Richmond.

Within two minutes afterwards, in the seclusion of an inner office, where pickpockets, I believe, are secured till the police arrive to take charge of them, I had made the inspector understand how matters really stood. But poor Lord Plantagenet had to play Sir Charles that night without his Blacksmith; and I will answer for it, though not a witness to the crime, that, on the charge of murdering that baronet, he would not, before any jury of critics, have cleared himself so easily as I did from that of murdering an hereditary nobleman.

The humour of the whole adventure was such that my own annoyance was soon forgotten in it; and I even employed the same Hibernian driver to take me home as had conveyed me to the station.

'What on earth made you think that I had murdered the nobleman, Pat, merely because he had disappeared?' inquired I.

'Well, shure, your honour, I can't tell, except that you looked like it.'

I must also have looked, I suppose, as if I had eaten him.

PARASITIC GROWTHS.

THE vegetable parasites which attack the higher organisms, and slowly lead to their destruction, perform a more important part in nature than appears at first sight. Wonderfully small plants count among the most energetic agents of those innumerable transformations which are constantly going on in the organised world, and cause the spectacle of life to be an ever-moving, ever-varying picture. When anything dies, either animal or vegetable, the elements of which it is composed return into nature's bosom; they serve to nourish new beings, which are in their turn decomposed. Myriads of microphytes and microzoaires, disseminated in the air, hasten the work by attacking organised bodies otherwise inert. Some, acting in the form of ferment, transform the tissues into new products, which serve as nutrition for vegetables; others give to animals the albuminoid principles which they require. Thus, between the two kingdoms, there is a perpetual change, and life presides over the work of death.

These cryptogames shew great reproductive forces, and there are few bodies in nature at whose expense they cannot find sustenance. Some vegetate on the hardest granite, others absorb with impunity virulent poisons. Every one knows the deleterious effects of white-lead—how the smallest portions in the air, daily absorbed by the respiratory organs, exercise on man a poisonous action, ending in death. Yet a fungus grows upon the refuse-heaps thrown out of the manufactory; it is saturated with lead, and becomes itself, by the absorption, a virulent poison. It appears that it is possible to take away from these hurtful kinds of fungi the noxious principle. The peasants of the Ukraine eat the false orange and other kinds with impunity, after salting them for some time. Another sure way is said to be by steeping them in water, with the addition of vinegar and salt. Three or four hours of this immersion suffice to make the worst kinds eatable, on the condition that they are thrown into boiling water when taken out; and both these liquids must be carefully thrown away, as they retain the poison. This purification of fungi has been mentioned in more than one ancient work, but the wisest plan is not to try anything so doubtful. The poison of many kinds is indeed so dangerous as to inconvenience those who simply breathe their emanations, and more than one botanist has been nearly suffocated by having left specimens in his bedroom.

Some antiseptic substances entirely arrest the growth of cryptogames, and have taken an important place in commerce. These are used to preserve wood; others for corn, seeds, and pastes, so that they may not afford aliment for what we call mould—only another word for small fungi. The efficacy of such agents is not altogether certain. Thus, resin ordinarily preserves those woods which are impregnated with it; yet there is a fungus which grows on the larches of Savoy, and draws from the trunks where it establishes itself a considerable quantity of resin, sometimes a third of its own weight. It only appears on trees that are already old, and gives the finishing stroke to their existence by carrying off the interior resin, rendering them liable to the attacks of other kinds of fungi or insects. The woodman who sees them in his plantation hastens to profit by the warning, and cuts down the tree. Thus various are the conditions in which cryptogamous plants develop themselves; and among so many varieties, it will be interesting to describe more particularly those that affect the food of man, and may be introduced into the human organism.

One of the most dangerous is known under the name of ergot, which attacks several kinds of grain, but especially maize and rye. For centuries past it has been the object of study; but it is only in later years, through improved methods of observation, that a knowledge of its nature and development has been derived. Not only does it attack the rye which grows on poor land, as many have asserted, but that of fertile fields, where the length of the stem and ear shew its richness, and thus fine harvests are destroyed. It is of a cylindrical and curved form, and often attains five or six times the weight and size of the grain it replaces. Chemical analysis also shews that the azote increases in equivalent proportion, and that the ergot secretes sixty times more of the fatty matters than the grain which supports it can furnish. Thus it

evidently nourishes itself on the juices of the stem, which were intended for the grain.

Those who live entirely on rye-bread have found the greatest inconvenience; some countries were formerly desolated by the maladies which it produced, a kind of gangrene attacking the fingers and feet. The animals on the farm suffered in the same way. Wise laws were made to seize the unwholesome produce in the markets, which was easily known by the deep violet colour which the fungus produced. The owners, by careful sorting, did their best to free the rye from the poisonous substance; but these precautions would have remained fruitless, had not the sale of the ergot become a valuable source of trade. Surgeons had long used it in a limited way; but, in 1845, it was found to be a powerful agent in stopping the flow of blood; and a preparation named ergotine has come into such general use that the price of ergot has risen rapidly, and it is worth about ten times as much as the rye itself. Thus, the cultivators separate it carefully, and this proves to be the best guarantee against the noxious article coming into the market. Ergotine is obtained by reducing the ergot to powder, mixing it with warm water, which carries away the soluble matters, and leaves the poisonous particles behind, mixed with oily matters. It is then concentrated; the albumen is withdrawn as it floats on the surface of the liquid. Thus, it has become possible to use with advantage one of the most dangerous of its class.

Another of these parasites is what is commonly called rust, *Uredo segetum*, a microscopical fungus, which invades whole fields. It has been noticed that it is chiefly developed on damp ground, and that it can be eradicated by good drainage, which makes the soil dryer and more healthy. There is also the *Uredo carbo*, which turns the ear as black as coal, and when thrashed, mixes with the grain. The *Uredo caries* is another of these pernicious growths, the germs of which are contained in the seed, and must be killed by a mixture of sulphur. All these give the flour and bread a gray tinge and a disagreeable flavour, whilst it is not impossible but that they may produce disease. As to their influence on animals, opinions are divided; some writers have attributed to rust a great mortality among sheep and horses, whilst others have fattened sheep upon wheat that was seriously affected by it; and a doctor in Mexico testifies to the fact, that a cryptogamous parasite of maize is employed there as an alimentary substance, bearing the name of *cueruo*, or raven, from its black colour.

Many surgeons attribute the prevalency of diseases of the skin among the indigent people of the south of Europe to the habitual use of diseased maize-flour; especially to a dangerous epiphyte which grows upon the seed when still standing. Though the fact that this produces disease cannot be fully demonstrated, it is at least agreed that bad harvests are always coincident with a great increase of these maladies.

There is a cryptogamous vegetation which has been little attended to, but which does not fail to produce frequent accidents, and merits some remark—namely, the mould which develops itself on articles of food left too long in a damp place. Bread made with too large a proportion of water, and maize-paste, are rapidly covered with greenish fungi, among which may be found some poisonous

kinds. Mouldy bread is not without danger; taken in large quantities, it produces slight symptoms of poisoning, such as giddiness, burning thirst, and a general depression of strength. Fowls have died from the effects of mouldy biscuits; and many accidents have been reported as happening after eating food which had been too long cooked, and when it had contracted a slight acidity. These may be explained by the growth of fungi, and what seems to confirm this supposition is, that in the circumstances they could not discover any trace of mineral poison.

Among these microscopic growths which are classed under the common title of mould, one of the best known is the *Penicillium glaucum*, so called because the assemblage of its globulous spores present the appearance of a brush under the microscope. It is found on bread, on cheese, and on decaying fruits: according to all experience, it is relatively innocent. An experimenter who wished to assure himself of this by direct proof, ate the whole of the mould on the surface of a jar of apricot marmalade: not having felt any inconvenience, the next day he tried that which covered some gooseberries, and again of some orange—in every case without injury. This does not fully prove that in a larger dose there might not be danger, but it seems conclusive that there is no active poison to be dreaded. Our everyday experience demonstrates this. If every bit of mouldy bread was a germ of disease, or if spoiled fruit could not be safely eaten, what would become of the poorest classes, whose poverty obliges them not to be particular? Every one knows with what rapidity food once touched spoils, moulds, and decomposes under the attacks of innumerable parasites. It is as if Nature was impatient to take away from man the substances which he borrows from her to appropriate to his own use. Bread must be eaten in a short time, or a legion of cryptogames present themselves to reclaim it, and convert it into dust, a fruitful dust, which would nourish the young shoots in a field of wheat. Their mission is to accelerate the transformations of matter; they will not permit us to preserve indefinitely the fruits which are ripe, or the flesh of the slain; in appearing, they warn us that our rights are not perennial, and that it is time to abandon to earth that which is dangerous for us.

Not only do they interfere with our food, but they often cause considerable damage to various manufactures. In the old-fashioned way of bleaching, linen may be seen spread for many days on the grass, so that the dew may destroy by a slow process of oxidation the coloured organic matters which the tissue contains. Damp also favours the development of the spores which the air lays upon the linen; and these gray or greenish-brown vegetations make spots which it is very difficult to remove; neither the washing with alkalis nor with water in which chloride of lime has been dissolved, can remove the vegetable fibres which wind themselves round the threads. Something similar is found upon sheets of gelatine and glue which are spread out to dry, either in the open air or in ventilated drying-sheds; especially if the operation takes place under a fog. Under the influence of these cryptogames, the animal jelly liquefies in places; the microzoaires brought by the currents of air excite a putrid fermentation, and form a number of small cavities, which deteriorate

the gelatine, so that sometimes it has to be remelted, at considerable expense. Accidents of the same kind are continually met with in the manufactories of vermicelli, where the pipes of macaroni and different kinds of Italian paste are made. These annoyances have, however, almost disappeared in those places where manufacturers have adopted the system of hot-air desiccation.

Very serious inconvenience arises from these developments in empty barrels which have held wine, beer, or cider. Their presence is indicated by a mouldy smell. If, after simple rinsing, which is almost always insufficient to remove them, the barrels are again filled, the liquid dissolves the mould, and contracts, after a few days, a particular and very disagreeable odour, which takes from it all its value. Thus, fine wines are ruined owing to the carelessness with which the barrels are prepared. If diluted sulphuric acid were poured into the infected barrel so as to impregnate the wood, the parasitic vegetation thus attacked would disengage itself, be soon dissolved, and might be washed away with a plentiful supply of water. After that, the barrel would no longer spoil the liquor put into it. The disagreeable flavour well known to wine-drinkers under the name of 'corked,' is probably owing to mould which has appeared in some cavity of the cork after it has been put in.

When wine becomes acid, it has been invaded by the flower of vinegar, *Mycoderma aceti*, the function of which seems to be to transform alcohol into acetic acid by a sort of incomplete combustion. This has been seen into by most housekeepers, when they give the name of *mother* to the membranes found in jars which have contained vinegar; and a rapid way of making vinegar has been based on this observation. Another analogous mycoderm, the flower of wine, does not occasion any hurtful fermentation, but seems rather to favour the reaction due to what is called the 'bouquet.' A worse malady has for its cause a growth which presents itself under the appearance of filaments of extremely slender aspect, and forms those slight waves which may be remarked when wine is shaken. This mycoderm has a strong affinity with that which produces lactic acid. Wines that are described by the growers as fat and oily, are charged by a fermentation which takes the form of globules joined together in a kind of entangled chaplets. What they call an old or bitter taste, is a malady which chiefly attacks the finest wines, and also has its origin in a special fermentation, which reminds the palate of wine turned acid; under the microscope, the floating particles are larger, and resemble the branches of dead trees. If the germs of these different mycodermas are killed by heat, the wine is safe from all change so long as it is kept in a closed vessel; but it is evident that these precautions are useless if new germs are brought with the air, or in unprepared wines which may be mixed with that which has been heated. After many experiments which have been made by the wine-growers of Burgundy, it is decided that it is well to heat the vintages to the amount of from sixty to eighty degrees, if only for a minute, and that, instead of losing their aroma and flavour, they are in fact rather improved. For the same reason, a voyage to a hot climate has been often recommended.

It is thus that the action of infinitely small beings is revealed to us on all sides; sometimes

useful, sometimes hurtful; and thus many have been led to believe that a great number of morbid affections in man may be attributed to the contact of these imperceptible corpuscles floating in the air. Certain evil effects often coincide with a damp state of the atmosphere, and yet may be due to the development of a whole world of minute creatures. After a prolonged study of the subject, it may be possible to explain many epidemics and the causes of contagion. It is, for instance, generally admitted that ringworm is produced by a vegetable parasite, the achorion, which is chiefly known among the children of miserable parents who are too indifferent to keep the skin clean: the accumulated secretions offer a suitable place for its development, whilst the spores passing through the air aggravate the evil. When the principles of hygiene are acted upon, this disease disappears.

There is a disease of the ear which has been observed among those who live in damp rooms, and may be ascribed to the growth of a fungus. A particular solution of chalk which is used for walls covered with white mould, is found to be efficacious in curing the ear. There is no doubt that microphytes of a particular kind attack the teeth, and slowly destroy them. The French chemists tell us that the virus of vaccine matter, and that of the small-pox, acts only through the corpuscles in it; when these are separated by filtration, the remainder has no appreciable action. Ophthalmia and many other affections which spread in the wards of hospitals, arise from the spores or seeds of microscopical organisms carried in the air. In this way, it is easy to comprehend how disease is aggravated by crowded wards, since the living miasmata are multiplied in a ratio equivalent to the number of individuals in a room.

According to several doctors, the spores of certain fresh-water weeds produce intermittent fever; indeed, it does not seem improbable that the unhealthy emanations from stagnant water—that terrible malaria which renders a residence in marshy countries so dangerous—are due to nothing else than the germs of the cryptogames which infect the water and the atmosphere. In the Maremma of Italy, not less than sixty thousand victims are yearly sacrificed by the marsh-fever, and two-thirds of the Europeans who live in the tropics die from maladies caused by the pestilential effects of this dire plague. Science has unveiled the evil genii which the ancients tell us lived in these spots, and forbade man to approach: they are myriads of imperceptible germs which invade our organs, develop themselves at our expense, and against which we have no defence.

The researches of M. Hallier seem to class Asiatic cholera among the number of epidemics caused by spores similar to those that attack rice. Having tried some rice in a particular manner, he watched the growth of the parasite, whose bright filaments penetrated the plant; and among those persons affected by the disease, sporules of extreme tenuity shewing the organism of a fungus nearly related to that of the oidium, or grape disease, have been found. No agent has yet been discovered which can prevent this scourge, but it has been proposed to try hot vapour of a temperature of a hundred degrees, and thus destroy one of the presumable causes of the terrible Indian malady. Space forbids our entering upon the many other

forms of this curious subject, such as the grape or cattle disease; and yet it is to be hoped that microscopic science will yearly define more clearly the part which they play in the production of epidemics, and establish a system of medicine at once efficacious and rational, for the destruction of these organised germs.

IVORIES, ANCIENT AND MEDIEVAL.

A HISTORY of ivory carvings was a desideratum, for there are few objects more interesting to the student of the arts of the medieval period. The volume before us* is illustrated by twenty-four photographs executed by the Woodbury process, and therefore absolutely permanent.

The earliest carvings on ivory extant are those found in the caves at Le Monstier and La Madeleine in the Dordogne, consisting of fragments of mammoth ivory and reindeer's bone incised or carved with representations of various animals. These were probably executed, says Sir John Lubbock, at 'a time so remote that the reindeer was abundant in the south of France, and probably even the mammoth had not entirely disappeared.' Of course the celebrated Egyptian and Assyrian ivories in the British Museum are modern compared with these. There are examples in that collection of the time of Moses, or 1800 B.C. Fifty Assyrian ivories, also there, shew the characteristics of the art at that period. When sent to England by Mr Layard, they were in a state of decay, but the decomposition was arrested, at the suggestion of Professor Owen, by boiling them in a solution of gelatine.

The various substances included under the term ivory are the tusk of the elephant, the walrus, narwhal, and hippopotamus. To these we must add the fossil ivory, so often used in early carvings. This was obtained from Siberia, where the tusks of the Mammoth are found along the banks of the large rivers. It is a curious fact that the largest tusks of ivory now procured would not furnish pieces as large as those which were used in the middle ages. There is every probability that the ancients softened the ivory, and could then enlarge the pieces. A fifteenth-century recipe in the British Museum directs that the ivory should be placed in muriatic acid, and it will become as soft as wax. By being placed in white vinegar, it hardens again.

The Greeks used ivory to decorate their couches, and also shields and arms. Greek sculptors did not think it beneath them to work in the substance. Pausanias has left us an account of some of these early statues, which he saw on his travels, among them an ivory statue of Venus at Megara by Praxiteles; one of Hebe by Naucydes; an ivory and

gold example, the work of Phidias, at Elis; and the coffer which the Cypselide sent as an offering to Olympia c. 600 B.C. Ivories of this period are of the utmost rarity. The British Museum fortunately possesses several examples which may fairly be considered the work of Greek artists. Early Roman specimens are also extremely scarce. The South Kensington Museum has a *plaque* of the second century, part of a cup, representing a sacrificial procession; and one leaf of a Roman diptych of the third century (the other portion being in the museum of the Hôtel de Cluny), upon which a priestess is shewn standing before an altar, sprinkling incense in a fire kindled upon it. In the Mayer Museum at Liverpool, two leaves of a diptych are preserved, upon which Æsculapius and Hygieia are carved. These fine examples are probably of the third century.

The following remarks by Mr Maskell will shew the interest and importance of medieval ivories: 'From the middle of the fourth century down to the end of the sixteenth, we have an unbroken chain of examples still existing. Individual pieces may, perhaps, in many instances be of questionable origin as regards the country of the artist, and sometimes with respect to the exact date within fifty, or even a hundred years. But there is no doubt whatever that, increasing in number as they come nearer to the middle ages, we can refer to carved ivories of every century preserved in museums in England and abroad. Their importance with reference to the history of art cannot be overrated. There is no such continuous chain in manuscripts or mosaics, or gems or enamels. Perhaps, with the exception of manuscripts, there never was in any of these classes so large a number executed, nor the demand for them so great. The material itself, or the decorations by which other works were surrounded, very probably tempted people to destroy them; and we may thank the valueless character of many a piece of carved ivory, except as a work of art, for its preservation to our own days.'

The word *diptych* means anything doubled or folded, and, among the ancients, referred to tablets upon which wax was spread for writing. A diptych was in two portions, a triptych in three, and the outer portions of the leaves were ornamented with carving. We have spoken of some as early as the second and third centuries, but important examples remain of the fourth, fifth, and sixth centuries. These were often sent by new consuls, on their appointment to the office, as presents to people of rank, governors of provinces, &c. In some examples, the name of the consul is carved across the top of the leaf, and the date is therefore determined with absolute certainty. A list of more than twenty of these consular diptychs is given by Professor Westwood in a paper read before the Oxford Architectural Society. The preservation of some of these diptychs is owing to the circumstance, that they could be adapted to Christian purposes. In one case, the difficulty was got over by placing the tonsure on the consul's head, and cutting the name of St Gregory underneath. For church purposes, they were convenient for inclosing the names of saints and martyrs who were to be commemorated in the services of the church.

All the large ancient plaques of ivory which

* *A Description of the Ivories, Ancient and Medieval, in the South Kensington Museum, with a Preface.* By William Maskell. Published for the Science and Art Department of the Committee of Council on Education, by Chapman and Hall, London, 1872.

have come down to us were not the leaves of diptychs. Some were used to decorate thrones or ceremonial chairs, such as that made for Maximian, Archbishop of Ravenna (546—556), and preserved in the cathedral at Monza. This has been engraved in the works of Du Sommerard and Labarte.

The theological quarrels which took place from the middle of the eighth to the same period in the ninth century, were very destructive to art in the East. The consequence was, that artists and workmen were driven to the West, and monarchs like Charlemagne encouraged them. Ivory became very fashionable, and besides being used for tablets, was employed for pyxes, book-covers, handles of fans, episcopal combs, and pastoral staves. From the ninth to the sixteenth century, ivory was used for a great number of purposes. Besides diptychs, triptychs, crucifixes, and statuettes for private devotion, we have caskets, horns, mirror-cases, toilet-combs, and chessmen for ordinary use. The caskets are generally decorated with scenes from medieval romances, and are therefore especially interesting. A fine example is in the South Kensington collection, of which a photograph is given. On the lid an ornament is shewn, and also an attack on the Castle of Love—a favourite subject. Other compartments illustrate subjects from the romances of *Alexander and Tristan*, and the celebrated one of *Lancelot*. The British Museum possesses an extremely interesting early English casket in bone, upon which the myth of Romulus and Remus and the storming of Jerusalem are carved. Mr Stephens, in describing this, says: 'It is one of the costliest treasures of English art now in existence. As a specimen of Northumbrian work and of Northumbrian folk-speech, it is doubly precious. But we know nothing of its history. Probably, as the gift of some English priest or layman, it may have lain for centuries in the treasury of one of the French churches, whence it came into the hands of a well-known dealer in antiquities in Paris. There it was happily seen, and purchased, some years ago, by our distinguished archaeologist, Augustus W. Franks, Esq. The price given for it was very great.'—Stephens' *Runic Monuments*. Mr Franks has liberally presented this valuable casket to the British Museum. It appears in the recently issued series of photographs of the gems of that collection.

It is interesting to notice the references to ivory caskets and coffers in medieval inventories and other documents. In 1502, we have this entry among the privy-purse expenses of Elizabeth of York: 'Item, the same day (May 28) to Maistres Alianor Johns for money by hir geven in reward to a servant of the Lady Lovell for bringing a chest of iverey with the passion of our Lord thereon iij. iiijd.' The church St Mary Outwich, London, had in 1518 'a box of eivry garnyshe with silver,' and 'a box of yvory with xj relyks therein.' Sixteen years after, the guild of the Virgin at Boston, Lincolnshire, had 'a littil box of iveri bound with gymes (gimmals) of silver.' Going back to an earlier period, there were in the treasury at Durham, in 1383, 'an ivory casket containing a vestment of St John the Baptist,' and 'a small coffer of ivory containing a robe of St Cuthbert.' Some of the caskets in the South Kensington Museum are decorated with morris-dancers and persons playing on musical instruments.

Combs were richly ornamented. One was found

among the relics in the tomb of St Cuthbert at Durham. This was doubtless used by a bishop before celebrating high mass. There is one of these characters of the sixth century in the treasury of the cathedral of Sens, and a fine example of the eleventh century in the British Museum. The South Kensington collection contains some made for domestic use.

Mirror-cases were ornamented with scenes from domestic life or from poems or romances. Hawking-parties, and people playing at chess or draughts, are frequently represented upon them. But perhaps more interesting than these are the chessmen themselves, examples of which, of the time of Charlemagne, are in the Imperial Library at Paris. Sir F. Madden says of these: 'The dresses and ornaments are all strictly in keeping with the Greek costume of the ninth century; and it is impossible not to be convinced, from the general character of the figures, that these chessmen really belonged to the period assigned them by tradition, and were, in all probability, executed at Constantinople by an Asiatic Greek, and sent as a present to Charlemagne, either by the Empress Irene, or by her successor Nicephorus. . . . One thing is certain, that these chessmen, from their size and workmanship, must have been designed for no ignoble personage; and from the decided style of Greek art, it is a more natural inference to suppose them presented to Charlemagne by a sovereign of the Lower Empire, than that they came to him as an offering from the Moorish princes of Spain, or even from the Calif Haroun al Raschid, who gave many costly gifts to the emperor of the West.'

Chess is mentioned in a history of Ramsey monastery, written c. 1100; and Chaucer, in his *Merchant's Tale*, describes a chessboard:

So when they had ydynd, the cloth was up ytake,
A ches ther was ybrought forth;
The ches was all of ivory, the meyne (set) fresh and
new,
Ipulshid and yplikid, of white, asure, and blew.

A remarkably fine set of chessmen were found in 1831, in the Isle of Lewis in Scotland, and are now in the British Museum. Sixty-seven pieces were found in all, belonging to several sets. These are of walrus-ivory (which substance has always been popular with nations of Scandinavian origin), and so are the majority of those circular pieces, like our draughtsmen, used to play at the medieval game of 'tables.'

Ivory crosier heads are generally very beautifully ornamented. These heads of pastoral staves were at first of the fan shape, like that in the South Kensington Museum of the eleventh century, acquired at a cost of two hundred pounds. The crook form superseded this shape about the end of the twelfth century. The serpent often appears upon them—an emblem of prudence and wisdom, or in allusion to the rod of Moses. Those which remain to us are so beautiful that it is a source of regret that so few have been preserved. Vast quantities of church ornaments were destroyed in England in the beginning of the sixteenth century, but the absence of examples of ivory pastoral staves is very remarkable.

The pax used in the middle ages for sending the kiss of peace from the celebrant to the people, was sometimes made of ivory; in fact, this substance

seems to have been largely used for almost every purpose connected with the service of the church. One of the most beautiful ivories in the South Kensington collection is part of the handle of a *flabellum*, or ecclesiastical fan. In the East, these fans were needed to keep off flies from the chalice, &c.; but in the West, says Mr Maskell, its introduction was a kind of fashion, and having no symbolism, an unmeaning introduction from the oriental rite. Holy-water sprinklers had often also richly carved ivory handles.

The beautiful ivory statuettes in which the South Kensington Museum is so rich, were generally used for private oratories. These were sometimes made more imposing by the addition of a canopy and wings, the latter being further ornamented with smaller figures. There was at Lincoln in 1536, 'a tabernacle of two leaves, gemmels (hinges), and lock of silver, containing the coronation of our Lady;' and also 'a tabernacle of ivory standing upon four feet, with two leaves, with one image of our Lady in the middle, and the salutation of our Lady in one leaf, and the nativity of our Lady in the other.' The largest statuette known is in the possession of Mr Alexander Barker. It is considered to be French, of the Burgundian school, and is twenty-three inches high, and six wide.

Medieval ivories were frequently coloured, and further enriched with gilding. Labarte, in his well-known work, gives an engraving from an illumination in a French manuscript of the fifteenth century, shewing a female artist painting a statue. In this, the medieval craftsman was only following the practice of the sculptors of the early Greek school.

Ivory crucifixes are very rare, and hundreds of fine examples must have perished in the sixteenth century. How significant is such a sentence as the following, found often in a series of returns made by the commissioners for the county of Lincoln—namely, 'with the rest of the trash and trimmerie w^{ch} apertaynid to the popish service,' in recording the ornaments destroyed. A very fine crucifix of ivory is preserved in the Catholic chapel in Spanish Place, London, the gift of Cardinal Wiseman. The figure is coloured to imitate life, blood being shewn by jewelled work in rubies. But, notwithstanding this, Mr Maskell says it fails in calling forth expressions of pure religious sentiment, the reality of treatment being too near the truth.

Besides the diptychs for private devotion, double leaves and single plaques were used in the middle ages for writing. The back of the plaque was depressed, in order to hold wax, which was written upon with a pointel or stylus. Chaucer, in the *Sompnour's Tale*, says:

His felaw had a staff tipped with horn,
A pair of tables all of ivory,
And a pointel ypolished fetislyh,
And wrote alway the names, as he stood,
Of alle folk that gaue hem any good. . . .
Or geve us of your braun if ye have any,
A dagon of your blanket, leve dame,
Our suster dere, lo, here I write your name.

In conclusion, we may remark, that the majority of medieval ivories belong to the fourteenth century, and the finest period for these works is from 1280 to 1350. Most ivories have been described as French or Flemish, but many of these must

surely be English. It is a pity that we cannot point to many examples which are unquestionable examples of English work. One of these is the triptych in the British Museum, known to have been carved for Grandison, bishop of Exeter; and a leaf of a diptych also executed for him. Sir Digby Wyatt, in a lecture before the Arundel Society, in speaking of the various styles, says: 'A peculiar *nez retroussé*, a dimpled, pouting, and yet smiling mouth, a general gentillesse of treatment, and a brilliant yet rapid mode of technical execution, stamp the French work with an almost unmistakable character. To the English style may be assigned a position midway between the French and the second Italian manner. It does not exhibit the gaiety and tenderness of the former, nor has it quite the grandeur of the latter, but it is marked by a sober earnestness of expression in serious action which neither of these styles possesses.'

Of all the medieval workers in ivory whose works are our wonder and delight, the names of two only have been transmitted to posterity. Sir D. Wyatt and Labarte each name one only, Jean Lebraellier (carver to Charles V. of France), and Jehan Nicolle, who executed a pax in the British Museum. Mr Maskell adds to the interest of his volume by giving an Appendix, containing a careful account of the ivories in the British Museum, Bodleian Library, Ashmolean, Soane, and Liverpool Museums, and the Meyrick collection.

We have added up the cost of the South Kensington ivories, and the following is the result: two hundred and fifty-two pieces cost L.18,070, or an average of L.71, 14s. But twelve of these cost L.6784—an average of L.565, 4s.—the highest price being L.2142 for the figures and plaques inserted in the Soltikoff Reliquary (twelfth century).

THE NAMING OF MOUNT TYNDALL.

To Professor Whitney, and his corps of the Geological Survey of California, the world owes its first scientific knowledge of the form, plan, and physical condition of the vast succession of mountain chains which form the western margin of the North American continent, and whose seaward base is beaten by the 'mild small breakers' of the Pacific. To one member of that corps, Mr Clarence King, we owe a minute description of the Sierra Nevada, by far the grandest of these ranges, and an animated account of the perilous exploration of the 'long and massive uplift lying between the arid deserts of the Great Basin and the Californian exuberance of grain-field and orchard; its eastern slope, a defiant wall of rock plunging abruptly down to the plain; the western, a long, grand sweep, well watered, and overgrown with cool, stately forests; its crest, a line of sharp, snowy peaks, springing into the sky, and catching the *alpenglow* long after the sun has set for all the rest of America.' The expedition travelled thousands of miles, and performed wonderful feats of climbing; but it must have been well worth any amount of exertion possible to human strength to have seen what those brave men saw, to have held such close and triumphant commune with nature in so many of her sublime and awful aspects. This tremendous range has Shasta for its loftiest point, Shasta, whose lava cone is 14,440 feet high, and whose broad base is girdled with noble forests,

which give way at eight thousand feet to a cap of glaciers and snow. It extends from latitude 35 degrees to latitude 39 degrees 30 minutes, in a continuous chain; and near its southern extremity, in San Bernardino's County, the range is cleft to the base with magnificent gateways, opening through into the desert. For two hundred miles northward, the sky-line is more uniformly elevated, the passes averaging nine thousand feet high, the actual summit a chain of peaks from thirteen thousand to fifteen thousand feet. This serrated snow and granite outline of the Sierra Nevada projected against the clear cold blue, is the saw of white teeth which suggested its Spanish name.

Every kind of wild, grand beauty adorns these great mountains, beyond which, on either side, lies utterly different scenery, so that the aspects of the Sierras from the east and west approaches are totally opposed. 'Along the western base is the plain of California, an elliptical basin four hundred and fifty miles long by sixty-five miles broad, level, fertile, well watered, half-tropically warmed, checkered with farms of grain, ranches of cattle, orchard, and vineyard, and homes of commonplace opulence, towns of bustling thrift. It has a certain impressive breadth when seen from some over-looking eminence, or when, in early spring, its brilliant carpet of flowers lies as a foreground, over which the dark pine-land and white crest of the Sierra loom indistinctly.' This is the picture on the other side. 'From the Mexican frontier up into Oregon, a strip of actual desert lies under the east slope of the great chain, and stretches eastward, sometimes as far as five hundred miles, varied by successions of bare white ground, effervescing under the hot sun with alkaline salts, plains covered by the low ashy-hued sage-plant, high, barren, rocky ranges, which are folds of metamorphic rocks, and piled-up lavas of bright red or yellow colours, all over-arched by a sky which is at one time of a hot metallic brilliancy, and again, the tenderest of evanescent purple or pearl.'

In 1864, Mr Clarence King and his party of five, being commissioned by Professor Whitney to explore the Sierra Nevada, started, with a most motley equipment, from Visalia, a small town embowered in oaks upon the Tulare Plain in Middle California. Grand and cool swelled up the forest before them; sharp and rugged rose the wave of white peaks, as they rode in the sunshine through miles of exuberant vegetation, into a region of dense woodland, entering, as it were, by a door, and passing into a vast inclosed hall. Among all the wonderful and beautiful sights of the Sierra, they could not forget those forest roadways, where there is all that is dark, and cool, and green in colour, the beauty of blue unbragous distance, all the sudden brilliance of strong local lights tinted upon green boughs, or red and fluted shafts, in ever-changing combination, and where, when they began to descend, they saw over the tops of the trees beneath them a mountain basin fifteen hundred feet deep, surrounded by a rim of pine-covered hills, with an even, unbroken wood covering its slopes down to the bottom, and in its midst a circular green meadow, a mile in diameter.

Crags, peaks, forests, and cañons, grandest vegetation, and most awful desolation, deepest repose, terrible danger, infinite enjoyment—such are the objects and the conditions of an exploration of the

Sierra Nevada. The day's work for men and animals is excessively laborious; the night's rest is profound, in spite of the roughest fare, and lodging by a mountaineer's camp-fire, under the stars. Upon every stream, and in all the finer camp-grounds throughout the forest, are found families of Indians, who have migrated thither during the hot weather, and who are very odd and amusing persons. 'I shall never forget,' says the explorer, 'certain bright June sunrises, when I have seen the Indian *Paterfamilias* gather together his little tribe, and address them in the heroic style concerning the vital importance of the grass-hopper crop, and the reverence due to the Giver of Manzanita berries. You come upon them as you travel the trails, proud stepping "braves" leading the way unhampered and free, followed by troops of submissive squaws, loaded down with immense packages and baskets. Their death and burial customs are wonderfully romantic.' Having passed through the vast zone of the forest, a scene more beautiful than words can tell, under a sky such as we can hardly imagine, the explorers began to prepare for an assault upon the summits above them. Two only of their number proposed, by the ascent of the huge peak which they afterwards called Mount Tyndall, to climb up 'to the top of California.' Before these two, Mr King and Mr Cotter, parted from their companions, the little company had reached twelve thousand five hundred feet, and the light air was beginning to tell painfully upon their lungs; and they all took a long rest upon the summit of the ridge, gazing upon the scene thus described: 'We looked down into a gulf five thousand feet deep, sinking from our feet in abrupt cliffs, nearly or quite two thousand feet, whose base plunged into a broad field of snow, lying steep and smooth for a great distance, but broken near its foot by craggy steps one thousand feet high. Vague blue haze obscured the lost depths, hiding details, giving a bottomless distance, out of which, like the breath of wind, floated up a faint tremble, vibrating upon the senses, yet never clearly heard. Rising on the other side, cliff over cliff, precipice piled upon precipice, rock over rock, up against the sky, towered the most gigantic mountain-wall in America, culminating in a noble pile of Gothic-finished granite and enamel-like snow. How grand and inviting looked its white form, its untrodden, unknown crest, so high and pure in the clear strong blue! From the two opposing mountain-walls, singular, thin, knife-blade ridges of stone jutted out, dividing the sides of the gulf into a series of amphitheatres, each one a labyrinth of ice and rock. Piercing thick beds of snow, sprang up knobs and straight, isolated spires of rock, mere obelisks curiously carved by frost, their rigid, slender forms casting a blue, sharp shadow upon the snow. Embosomed in depressions of ice, or resting on broken ledges, were azure lakes, deeper in tone than the sky, which at this altitude has, even at mid-day, a violet duskiness. . . . Before he let go my hand, Professor Brewer asked me for my plan, and I had to own that I had but one, which was to reach the highest peak in the range. After looking in every direction, I was obliged to confess that I saw as yet no practicable way.'

Then the two men bade their comrades good-bye, and departed to their awfully perilous task, and the desolation of sky, snow, and granite. They found

shelter during the first night in a crevice near the margin of one of the frozen lakes; a shelf, just large enough to hold them, where they ate their supper of cold venison and bread, and 'whittled' from the sides of the wooden barometer case shavings enough to warm water for a cup of tepid tea, and then rolled themselves in their blankets, to rest as well as they could; while immense blocks, dislodged from the mountain summits, under the sudden, powerful leverage of frost, came thundering down the slopes, many of them striking the ledge of rock above their heads as they whizzed into the gorge. With the morning began the climbing, in terrible earnest. It was, from the first, essential that they should not look back, along the awful slope of frozen snow, in which they had to cut steps with bowie-knives. Even to look up was disheartening, for up there, everything seemed impossible, except death. Here is just one picture of climbing, which is again and again repeated in this wonderful narrative. They had reached a mere shelf, two feet wide, which led diagonally up the smooth cliff, and along this they edged in careful steps, their backs flattened upon the granite, and so came to a broad platform, where they stopped for breath: 'There was no foothold above us. Looking down over the course we had come, it seemed, and I really believe it was, an impossible descent, for one can climb upward with safety where one cannot downward. About thirty feet over our heads was another shelf, with two or three spikes of granite on its edge. I thought of a plan. It was to lasso one of these blocks, and climb, sailor-fashion, hand over hand, up the rope. I tried three times, and at last I made a lucky throw, and the rope tightened. I drew the noose close, and very gradually threw my one hundred and fifty pounds upon the rope; then Cotter joined me, and, for a moment, we hung our united weight upon it. Whether the rock moved slightly, or whether the lasso stretched a little, we were unable to decide; but the trial must be made, and I began to climb slowly. The smooth precipice face against which my body swung offered no foothold, and the whole climb had therefore to be done by the arms, an effort requiring all one's determination. When about halfway up, I was obliged to rest, and, curling my feet in the rope, managed to relieve my arms for a moment. In this position, I could not resist the fascinating temptation of a survey downward. Straight down, one thousand feet below, at the foot of the rocks, began the snow, whose steep, roof-like slope curved down in a long, white field, broken by rocks and round lakes of polished ice. A few pulls hand over hand brought me to the edge of the shelf, when, throwing an arm around the granite spike, I swung my body upon the shelf, and lay down to rest. After a few moments, I looked over the brink, and directed my comrade to tie the barometer to the lower end of the lasso, which he did; and that precious instrument was hoisted to my station, and the lasso sent down twice for knapsacks, after which Cotter came up the rope in his very muscular way, without once stopping to rest. We took our loads in our hands, swinging the barometer over my shoulder, and climbed up a shelf which led in a zigzag direction upward, and to the south, bringing us out at last upon the thin blade of a ridge which was connected with the summit. It was formed of huge blocks,

shattered, and ready, at a touch, to fall. So narrow and sharp was the upper slope, that we dared not walk, but got astride, and worked slowly along with our hands, pushing the knapsacks in advance, now and then holding our breath when loose masses rocked under our weight. . . . Thus we reached the summit of the crest of the divide, and sat down to lunch at thirteen thousand feet above the sea.'

And yet this was not the most terrible bit of climbing which the brave mountaineers accomplished, before they succeeded in scaling the great summit which lay before them with awful cañons, and pinnacles of rock, ice-lakes, pitiless sheer descents, and smooth granite walls between it and them. They were in a more dangerous position in one downward climb, which turns one giddy merely in the telling; and in another ascent, which brought them to within five hundred feet of their object, where, midway, they reached a place where the granite rose in perfectly smooth bluffs on either side of a gorge. This terrible obstacle scaled by cutting in steps, they were fronted by a still higher wall, from whose front ice sloped at an angle too steep for them to follow, but had melted in contact with it, leaving a space between the ice and the rock three feet wide. *They entered this crevice, and climbed along its bottom to the upper end, where they had to cut their footsteps upon the ice again, and, having braced their backs against the granite, climb up to the surface. To fall into the crevice upon one side was to be wedged to death between rock and ice; to make a slip was to be shot down five hundred feet, and then hurled over the brink of a precipice. The task before them was to scale a hundred feet of rock, and then to find a place at which the smooth granite wall, which rose above the snow-slope apparently quite round the peak, could be climbed. There was an icicle column, its base ten feet wide, frozen in a niche of the bluff, and in this they began to cut a staircase, whose material was exceedingly compacted snow, passing into clear ice as it neared the rock. There was a constant dread lest their ladder should break off, and they be thrown either down the snow-slope or into the bottom of the crevasse. 'At last,' says Mr King, 'in order to prevent myself from falling over backwards, I was obliged to thrust my hand into the crack between the ice and the wall, and the spire became so narrow that I could do this on both sides; so that the climb was made as upon a tree, cutting mere toe-holes, and embracing the whole column of ice in my arms. At last I reached the top, and, with the greatest caution, wormed my body over the brink, and, rolling out upon the smooth surface of the granite, looked over and watched Cotter make his climb. He came steadily up, with no sense of nervousness, until he got to the narrow part of the ice, and here he stopped and looked up with a forlorn face to me; but as he climbed up over the edge, the broad smile came back to his face, and he asked me if it had occurred to me that we had, by-and-by, to go down again.'*

The above forms only one incident in a most picturesque narrative, only one adventure in a most hazardous and courageous undertaking; but there is no moment in the life of the mountaineers in the Sierra Nevada more spirit-stirring to contemplate than that on which, having hurried up the easy

slope to the summit over ice and boulders, they reached the long-desired crest exactly at noon. Then Mr King rang his hammer upon the topmost rock; and while the companions grasped hands, he named the grand peak Mount Tyndall.

HANDSOME.

IN FOUR CHAPTERS.—CHAPTER IV.

Shall so much empire o'er the soul
Live in mere beauty's smile, and no control
Bind down the heart to keep a steadier faith?

In the third winter came a great storm, which was long remembered in those parts. A night and a day it had raged, and shewed no signs of abating when night came round again, and the sun went down, staining the sky with angry sudden red, behind the last far-off inky billow of the indignant sea. Hour after hour, the light-house had shuddered from tower to base, and glittered in the flashes of lightning with the long white streams of foam that ran down it, as the hungry surfs fell balked and hissing back into the black-green gulf below. Fragments of wrecked ships, gone to pieces Heaven knows how far off, but driven here by the fury of the tide, floated in the eddies among the rocks; young gulls washed out of their nests; strange sea-creatures and plants, torn from their deep retreats in foreign seas; and a homely boat, patched and sea-worn—a *Heather Bell*, or a *Pretty Susan*, from one of the fishing-villages on the coast—told its own sad tale. Through all, the supreme light, crimson and white by turns, burned steadily; and the three men stood together by it, watching the boiling ocean, holding their breath at the saddest thing of all, a wrecked ship—a large yacht—foundering within sight, but out of reach of help. A dozen times they had tried to put out a boat to her assistance, but had been hopelessly driven back by the violence of the storm, and now they stood helpless, with *Jack* among them, silent, bright-eyed, quivering with excitement, pressing against his master's feet, and looking up for sympathy.

'Dog 'ud like to save 'em, I'll be bound,' said old Adam.

Mr George made no answer; he was wondering if on board that wreck there were any man who loved life, and had good days before him he could not bear to miss, instead of twenty-seven years of desolate bondage.

'What's that,' cried Jim Saunders suddenly, 'floating yonder on the piece of timber—something white?'

The other looked at it a moment, and drew his breath hard. 'Look after the light, Adam!' said he with a voice of sudden authority.—'You, Saunders, come down with me. Don't stand staring there. It's a woman, I tell you, and I may save her yet.'

'But no boat 'ud live, even if we could get her out,' said Jim breathlessly.

'It's close by,' said Mr George, with a certain calm recklessness. 'I can swim.'

'Yes, and get your brains knocked out against them rocks.'

Mr George laughed, and ran down the staircase.

A moment more, and with a rope round his waist, the other end of which was lashed to an iron stanchion in the wall, he was standing on the

verge of the crag, *Jack* beside him, trembling with delighted eagerness, but well aware, by the strange instinct implanted in his race, that some grave and difficult work lay before him. Jim stood by watching, ready to guide the rope as far as was possible in such a sea; while the older man strained his eyes anxiously from the tower.

As to Mr George himself, he was calm; measured his distance, and calculated chances under that awful sky, and before that awful ocean, as he might have done in the sunniest summer day. He had not been afraid of death, had desired it; yet when it came so near in, possibly, so cruel a shape, human nature shrank somewhat from it.

No enthusiasm upheld him; he doubted his own power of saving the unhappy waif; he knew that his own fate might not be death, but a worse repetition of the torture he was too well acquainted with—a long life, perhaps, made absolutely helpless. A slight plaintive feeling came into his mind, of how dear life might have been; a prayer rose to his lips; he stooped, patted *Jack*, and spoke encouragingly to him, and then, gathering all his strength, sprang clear of the rock into the boiling waters.

From that moment he remembered little, save a fierce incessant battle with the breakers, which fought him back from the white thing that gleamed every now and then before him, and stirred faintly. It was not like real life, it was like an awful fever-dream—the black night, the seething waters, the piercing, hissing blast; the fragments of plank and spar that bruised and tore his bare chest, as he struggled on, *Jack* fighting beside him. But there came a moment of delirious joy, when he grasped with one desperate hand, with his clenched teeth, a white garment, and felt against his chest the plank which supported it. The worst of the nightmare was past then.

He turned, and return was easier, for Jim cautiously tightened the rope, and drew him and the burden he guided slowly back. Then a watery moon broke out from a rift in the inky clouds, and a strange thing befell. As his cold wet cheek touched something white, and wet, and cold, which the waves drove against him, a vision of the bright, dead Past came back, clear as reality. There was no more furious ocean, black cloud, howling blast, no more lonely years before and behind him, no crippled life, pain or tears, or trouble any longer in the world. He was back again with his love, standing by the bright blue summer sea, the crystal ripples at his feet, the sunshine overhead, the soft western breeze around; with her little hand in his, her first vow trembling on his ear. He answered, blissfully: 'Netta! Darling!'

'Dolly!'

Then a cold bitter wave leaped up over his lips, about to gasp a passionate response, and broke the spell. Storm and midnight came down again, and wrapped them like a shroud, and he knew, that though indeed, by a strange chance, he had rescued his old and only love, it was not for himself; that Dolly Tempest was for ever dead, and only Mr George, who might save other lives, but could never more take pleasure in his own, alive. Yet he struggled on, and at last, bruised, bleeding, exhausted, but with his precious charge still safe, was dragged ashore.

He did not hear Adam's congratulations, Jim's triumphant declaration: 'We've saved one too;'

she came driftin' up, on a boat, bottom upwards, to the very door;' nor even *Jack's* subdued whine of pain, for the poor brute had been dashed against the rocks, and hurt; but with a last instinct, committed his burden to Adam, gasped: 'Take—take care of her!' crawled to his room, and fainted on the threshold.

When he came to himself, his first thought was, that that moment of mutual recognition must be blotted out for ever from remembrance. He saw that Netta might easily be made to believe it an illusion, the result of her own delirious terror, and, therefore, having resumed his customary disguise, caught Adam as he passed, and drawing him into the room, said in a voice whose stern falter gave his words weight: 'If the lady asks who saved her, say, and let Saunders say, it was he, not I.'

'Jim! Mr George?' cried Adam in surprise. 'Why, Jim might follow well enough, but he'd never lead, nor do nothing of the kind you've done to-night.'

'He must say so, nevertheless,' said Mr George firmly and sadly; 'I don't wish her to know of my existence, *now*.'

Yet he was sick for sympathy at the moment, and so far forgot his reserve as to touch his muffled face significantly, and look mournfully at Adam. The old man understood his meaning partially.

'Eh, I wouldn't do that, sir,' said he kindly; 'I'd let her know, and give her the chance. Women's queer cattle; but a lass isn't *always* caught by her eye.'

But Mr George turned away unconcerned, and repeated sharply, as if opposition hurt or tempted him: 'Tell Jim.'

Adam went away and did his bidding; and as Mr Saunders happened to be careless of truth in the abstract, and roughly faithful to his friends, he required neither persuasion nor explanation to obey Mr George's request.

Accordingly, when Netta Brydone came to herself, and a faint, scarcely credible memory crossed her mind, her first eager question: 'Are you the man who saved me?' was answered by Adam: 'No, miss—ma'am [hopeless confusion as to the proper title]; that's him.' Whereupon Jim advanced, and, with an air of calm self-satisfaction, received the praises and thanks which, after a moment's doubt and hesitation, she bestowed upon him freely.

She was ill with cold, fatigue, and fright, and lay scarcely conscious for the first day, looking dreamily into the little fire, her maid (who was Jim's trophy from the sea) attending upon her. That lady, Mrs Barker by name, was conveniently and blindly ignorant of who had saved herself or her mistress, and how they had done it. She had been washed off the wreck as she was holding on to a boat, as the latter had been, and they had been 'drowned' together, she said, and 'thank 'evins!' had been 'brought to life again in this awful place;' and that was all she knew.

Mrs Brydone looked melancholy at this reply; for the more distinctly her consciousness returned, the keener grew her belief in the reality of that voice in her ear, that touch on her cheek, that gleam—though only in the wild lightning, or the dim, fleeting moonlight—of a well-known face.

'Barker, is there another man in the light-house besides those two?' asked she wistfully.

'Yes, ma'am; there is.'

'What is his name? Do you know what he's like?'

'Mr George, ma'am. A humpback, or deformed, or something, from what they says; and keeps out of sight always, and has quite a craze to be for ever doing of his work,' said Mrs Barker, who, if the peculiarity mentioned were a symptom of insanity, was indubitably in the fullest possession of her senses.

Netta's heart sank: no description could be more unlike handsome, indolent Dolly. And then, how mad, how foolish she was to imagine he could be alive after all, just because, amid the din of the storm, a voice had sounded, a hand had felt, like his! Perhaps no voice had spoken, and it was all a dream; perhaps, in her peril, she had come so very near the gates of death, that his voice, who had passed through them years ago, had been able to reach her; for had she not remembered him, her first love, always, and only married Brydone for her family's sake, and been a good wife to him because it was her duty? Perhaps—And so, dreaming, wondering, and unable fully to reason away her unreasonable hope, Mrs Brydone fell asleep.

That day was a torture to Mr George. When once he had done his work with fiery energy, and done Adam's and Jim's as well, and walked up and down his room till his limbs fairly failed beneath him; when he had fondly tended poor *Jack*, who, to add to his master's troubles, was sorely hurt—his courage failed; and, unable longer to keep his bitter thoughts at bay, he sat down, and gave them battle at close quarters. He asked himself, if, after all these years of trial and self-denial, he was so weak as to yield blindly to his own passions, declare himself alive and loving still, and grieve her tender heart, as he must do either way, whether she accepted or refused him: if he was such a coward—so mean as to wish her to link herself with a hideous object like him, from whom his kind must shudder and turn away. Had he let her suffer the shock of his supposed death, let Brydone go and win her—saved her precious life only yesterday, to force on her such a fate at last? His morbid fancy, darkened by his lonely life, conjured up again and again the certain look of horror and dismay on that face, which had smiled, fond, loving, admiring, in his, that sunny September day at Penona. 'Whatever might come afterwards, I could never forget that first look. She *could* not love me now!' he groaned. 'She could only pity, and wonder, and be ashamed of me. Love *me*? Impossible! O God!' he prayed, dropping on his knees, 'take her out of this place soon, and deliver me from temptation!' He might struggle, pray, resolve, but nature was too strong. That evening, when Adam and Jim were on watch up-stairs, Mr George crept shoeless out of his room, and went noiselessly—fearfully, to the door of the apartment given up to Netta and her maid. The minute before he had sternly determined never to look upon her face again; the next, he had said: 'But *this* cannot hurt her. She shall not see me, or know.' So, like a fool, or a lover—not a jot wiser for all his sufferings, he stood at the door, listened, and finding it ajar, and all silent, save for the quiet breathing of one of its inmates, and the turning of leaves of the book she was reading by the other, ventured to look in. The maid had her back to him, and was reading; Netta sat in a chair by the

fire, fast asleep, with her girlish figure relaxed, her rose-mouth parted, her little white teeth gleaming in the firelight, the long brown lashes lying serenely on her fair cheek—just as fair, though a little less round than it used to be. Awake, she was somewhat altered; but asleep, expressionless, except for the peculiar innocence of slumber, she seemed almost as much a child as ever. Mr George gazed, and gazed silently with bitter yearnings, feeling like a ghost haunting the partaker of its past joys, then, hearing a sound, turned away, and fled to his own room. Next day passed in the same manner, the weather continuing too stormy; Mrs Brydone too much exhausted for her to be sent ashore in either of the boats, even could a crew have been procured.

In the evening, the temptation which appeared so harmless, again proved too strong for Mr George, and he repeated his timid and secret watch. This time, however, the door-handle creaked under his trembling hand, and Mrs Barker, glancing up quickly, and seeing indistinctly his muffled face, and then his figure taking hasty flight down the passage, returned, and excitedly recounted the fact to her mistress, throwing out dark suggestions of a desire on the part of the mysterious visitor to 'murder them in their beds.'

'What was he like, Barker?' cried Netta vehemently. 'Fair, with blue eyes?'

'Well, I don't know, 'm,' replied Barker crossly; 'I know as he looked very sinister.'

'Oh, nonsense!' said her mistress, accustomed to this worthy person's far-fetched alarms. 'Just ask one of the others—from yourself, Barker—whether the third man has fair hair—very fair?' added Netta with a silly, lingering tenderness of cadence.

Mrs Barker, however, injured at her want of sympathy, instead of transacting the errand with due discretion, captured the luckless Jim, brought him into the very presence of her mistress, and then saying, 'I thought you'd like best to ask the young man the question yourself, ma'am,' left the room grimly.

Natural reticence and timidity prompted Netta to make some frivolous inquiry, and dismiss him; but something stronger conquered, and besides, the whole scene and position were so strange, it seemed easy to throw aside conventionalities. So she plunged straightway into the subject, and said, with her eye on the shuffling Jim: 'There is another keeper whom I have not seen in the light-house, isn't there?'

'Yes, 'm,' replied he reluctantly, and making a movement to retreat.

'His name is Mr George?' continued Netta in a sweet, coaxing voice. 'Now, I had a friend once of that name, and I am quite anxious to know if this can be he. So I shall be so much obliged if you can tell me. Has he fair hair?'

Jim was posed; concluded hastily that if truth were against Mr George's wishes, lies must be in his favour, and answered boldly: 'No, 'm; black.'

'His face is covered with a handkerchief,' said Mrs Brydone, remembering Barker's account, and instinctively doubtful of Jim's veracity.

'O no, 'm, it ain't,' said he glibly, still on the same principle; 'not it.'

'He has a very low voice; I heard him speaking this morning in the passage.'

'Low? Why, you can hear him a'most all over the place!' exclaimed Jim, in apparent astonish-

ment. 'Can't have been Mr George as you heard.'

'Then there's some one else here, besides,' said Netta positively.

Jim shook his head solemnly.

'Then it was him.'

'Might have been me, 'm,' suggested Jim, doubtful if he were not taking a liberty in assuming the identity of Mr George.

Mrs Brydone dismissed him in despair; but, in spite of his answers, her instinct of suspicion grew unendurable, and at length yielding to it (like a sensible woman), instead of reasoning herself out of it (like a sensible man), she set her wits to work, and formed a little plan.

When Mr George, after keeping a long watch, awoke late next morning, his first thought was of Jack. He went to the dog's bed, and called him. No answer. He put his hand fondly on the great brown paw that lay stiffly stretched out, guarding one of his own gloves, which he had given the poor animal to keep him quiet. Alas! that faithful paw was cold; those soft, adoring, golden-brown eyes glazed and sunk; those alert, curly ears fallen, never to rise again, even at the sound of the voice they had worshipped. Jack was dead.

Mr George fell back against the wall, and stood leaning there, looking at his lost friend for a long time; from the quiet body to the gray, dull little square of sky beyond the window, over whose ragged cloud-drifts night was slowly closing; and thence round the four blank walls of his desolate abode. 'Jack is dead,' he said aloud—trying to realise it—'dead! Jack loved me. I have nothing on earth now.' Then he took the sad, stiff body on his knees—a position rarely allowed, greatly coveted by Jack when alive—and sitting down by the fading red embers in the tiny fireplace, hid his face on that brown, curly coat. Jack was gone away for ever—faithful, loving, generous Jack! Soon, even his poor cold clay must be flung away into the bright green billows he loved to breast and conquer living. Jack was dead.

Night fell, heavily and sadly, with neither moon nor stars; the men's voices came dimly from the watch-room, where they laughed and talked; Mrs Barker, in her mistress's room, snored audibly over an old-fashioned novel belonging to Adam. Mr George's wearied head fell lower and lower, and sleep came mercifully, and numbed his aching heart.

But one person was awake, and thinking of him. Netta's slender figure came stealing, with soft, light step and trembling heart, along the passage to his door. And now she had reached it, she paused, listened to her own heart-throbs, felt the blood rush to her cheek, and asked herself what bold thing she was doing—she, Ralph Brydone's widow! Yet now she was so near, it seemed a pity not to know at least the grounds of her improbable fancy, if it had any—which was not likely, of course!

She entered gently. Dark shadows were over the room; but a dim remainder of light flickered round the fireplace, on a man's figure, despairingly bowed over a dog's dead body stretched stiffly across his knees; and a sigh broke the silence, long and hopeless, the voice of a heart that, after long passion, had bled itself dry. What was there familiar in that sad sound—that figure? Was it the flickering light of the dying fire, or the real

brightness of fair shining hair? Tears rushed into Netta's eyes, and she stole swiftly, silently round, dropped on her knees before the sleeper, looked up in his face, and saw—all! The handkerchief had fallen off; the careful disguise of so many years had, in a moment—the moment when it was most needed—failed. Scarred cheek and temple, broken nose, change and disfigurement, were all plainly revealed. But it mattered little. Two lips, soft and warm, pressed on Mr George's cold cheek, made him quite sure he must be dreaming; and, with a sad habit he had acquired, he tried to awake, that the bitter disappointment of waking might be over. But, strange! only more and more kisses followed, and his startled eyes, opened widely, wildly, met two tender, wet, blissful ones looking down; his hand, put up frantically to feel for his disguise, was fondly captured; his lips, beginning to utter a despairing remonstrance, were struck dumb by the touch of a soft brown curl; the cloud of his bitter doubts was driven away by the sunshine of a smile; and the horror he had morbidly dreaded all these years never came to pass at all; for he awoke with his head on Netta's heart.

Do you think arms and eyes and lips let him go till he was convinced by sweet, illogical, playful reasonings; taught, by floods of fond tears, to be penitent for his morbid fears; or that that black handkerchief, like the black pall which had fallen on his life, was ever reassumed? No; Miss Netta flung it 'and everything,' as she said, into the fire, with great scorn, that very evening; and when she had cried a little over poor Jack, and, after her old fashion, argued with the greatest warmth (though there was not a soul to oppose her) that animals *certainly* had souls, and would consequently have a paradise, &c. she put her hands with tender coquetry on Tempest's shoulders, and inquired: 'Do you remember the questions I used to ask you—about whether you liked all sorts of things?'

'Perfectly, my darling.'

'Well, I've got *one* left to ask. Now listen, sir,' Tempest acquiesced, but looked at her with a certain nervous apprehension. He could hardly believe yet in the possibility of his happiness.

But the question came, and if that did not convince him, especially when uttered with such sparkling, tearful eyes, tremulous lips, and blushing cheeks—with such a look of fond and proud affection—I don't know what could: 'Would you like—to marry me?'

Dear reader, can you put yourself in his place, and guess his answer?

THE MONTH:

SCIENCE AND ARTS.

THE coal question appears to be simplifying itself in a very natural sort of way—namely, by a greater yield of the black mineral, or new discoveries thereof in other countries. India will prove a grand resource. In the presidency of Bengal alone, forty-four coal-mines are at work, and of these there are nineteen each turning out more than ten thousand tons a year, and every year the quantity is increased. The locomotives of all the railways that run to Calcutta, and also the steamers on the Ganges and other rivers, now burn the coal of Bengal, which are facts full of promise.

According to 'hazy tradition, India was once pre-eminent for mining industry: whether or not, it seems likely to become famous for coal in the present century. We hear, too, that coal has lately been found in Assam: hence, there will be a supply for the upper as well as the lower provinces. For years past the existence of coal in the Eastern Archipelago has been known and turned to account; and now that Englishmen are pushing their way from south to north all through Central Africa, we may expect to hear of large discoveries of coal, as well as of other minerals.

Another fact in connection with this subject is worth notice. It has been proved in India that a railway with five-and-a-half feet gauge can be constructed at from five thousand to seven thousand pounds a mile. This gauge is well adapted for the transport of native merchandise; and Colonel Kennedy, an engineer officer, recommends that, in districts which require to be brought into communication with the main line, ordinary roads should be made of such a width as to allow of laying down the five-and-a-half feet railway at some future day. These branch roads could be made for five hundred pounds a mile, and the traffic might be carried on by Thomson's road-locomotives, which have proved their efficiency. It is an advantage that these roads may penetrate a district in association with irrigation canals, for the bank of a canal is a good foundation for a road.

People who live in London are apt to be proud of what they regard as their advantages; but they sometimes fail to see the reverse side of the question. Among their disadvantages it is notorious that they burn the very worst gas in the kingdom, and that better is not to be had within the limits of the metropolis. Perhaps there is now a chance of improvement: the Metropolitan Board of Works have established gas-testing stations, and the Board of Trade have appointed three scientific men of high repute as 'gas referees,' who are to decide whether the gas supplied to Londoners is as good as it ought to be or not. We hope the time is not far distant when gas with its deleterious effects will be superseded by some far better means of illumination.

We learn that a new contrivance, an expanding gun-carriage, has been brought out at Woolwich. It displays ingenuity, and will save much trouble, as it will work with guns of any size from twelve tons up to the biggest—the thirty-five ton. Hitherto, with every change of gun, the carriage had to be changed.

Manufacturers, retail dealers, and others who keep a small stock of gunpowder on their premises, often frighten their neighbours, if not themselves, by exciting fears that the gunpowder may 'go off' if a fire should break out. Perhaps no one would feel much alarm if the powder were kept in a fire-proof safe; and experiments have been made at Woolwich which prove that this condition is possible. Experimental safes were constructed by Milner & Co. with double iron plates, and the space between the plates filled with a kind of padding warranted to resist heat. In one, a quantity of powder in canisters was shut up; in another, an open half-barrel of powder; each being differently charged, with a view to arrive at the best possible conclusion. The conditions imposed by the government authorities were, that the safes should

resist fire for six hours without explosion, and these conditions were satisfactorily fulfilled; for although the safes were buried in the heart of a coal-fire as big as a haystack, not one of them blew up. It was then thought desirable to see how long they would stand the test, and they were left in the fire. One blew up at the end of sixteen hours, another at nineteen hours; but the third stood fire for twenty-four hours, and was then taken out little the worse for the fierce trial. The powder was found to be caked on the outside, but within appeared to have undergone no change; but this is a point to be decided by further examination. Whatever the result may be, it is certain that safes can be made which will stand fire for many hours without explosion; and it may be that the law will require that all persons holding gunpowder on their premises shall keep it in a safe.

With increasing population and rising wages, the food-question becomes more and more important. Unfortunately, the great mass of the English people do not know how to economise food, or to cook it properly. There are many articles of diet, savoury and nourishing, which they utterly neglect or despise; and it is quite clear that our new system of education must include training in the art of cookery. Fish, especially, is one of the neglected articles, and yet the supply is inexhaustible, and might be sold at a moderate price, did not a selfish trick of trade stand in the way. When too much fish is brought to market, enormous quantities are wasted and sold as manure, rather than that the price should be lowered. How much longer is this disgraceful practice to be maintained? Our own fisheries seem never to fail; but should the supply run short, the seas of Norway will furnish enough for us, and for half Europe besides. And on the coasts of Iceland the abundance of fish is such that the quantity exported is worth from five to eight million pounds sterling annually. Evidently, there is no lack of food: the question is how to bring it to the mouths that ought to eat it.

It appears from a Report published by Mr Consul Crowe, that not only are the Iceland fisheries generally abundant, but that of late years—having been let alone—whales have increased and multiplied to a surprising extent. An enterprising American has taken advantage of this fact, and pursuing the whales with a small steamer, he fires into them an explosive harpoon of his own invention, which bursts inside the animal, and kills it outright, whereby time is saved, and much risk is avoided. The business is profitable, for an Iceland whale yields from fifty to one hundred barrels of oil.

Some of our readers will perhaps remember that, since the practice of electro-telegraphy began, experiments have been made at different times to prove that messages could be sent through water without any wire at all. Copper plates were buried on each side of a river, for example, or of a creek, and on flashing a current across, it was found that a sufficient quantity struck the opposite plates to make signals. The distances thus traversed were from two hundred to four hundred yards; but we have heard that in the United States the experiment succeeded through a mile of water. Of course, if messages could be forwarded without wires, a large saving would be made in the cost of telegraphy; but as yet that method has not been reduced to practice. Recently, however, the subject has been discussed

before the Society of Arts by Mr Highton, in a paper on *Telegraphy without Insulation*. He does not propose to do without wires, but he would use naked wires, and thereby save the enormous outlay for gutta-percha and other materials now considered indispensable to an undersea telegraph line. Mr Highton says that he began his experiments in the Thames twenty-five years ago, and satisfied himself that it was possible to send signals through unprotected wires. This was a surprise; but on investigation, he found 'that water itself is so perfect an insulator for electricity of low tension, that wires charged therewith retain the charge with the utmost obstinacy. . . . What the true theory of this may be,' adds Mr Highton, 'matters but little; the fact remains the same, that, in some way or other, every liquid is for currents of low tension a very good insulator; in fact, there is no such thing as a perfect insulator.'

The efficiency of a telegraph cable is reckoned by units, in a way well understood by telegraphists; and if a cable, on being tested, shews one hundred and seventy thousand units, it is regarded as excellent. But, according to Mr Highton, 'it is quite feasible to telegraph even across the Atlantic with an insulation amounting to not more than a single unit.' The instrument by which the signals are to be transmitted is the 'gold-leaf instrument,' acted on by a powerful electro-magnet. 'You may judge of its delicacy,' remarks Mr Highton, in his lecture to the Society, 'when I shew you that the warmth of the hand, or even a look, by means of the warmth of the face turned towards a thermopile, can transmit an appreciable signal through a resistance equal to that of the Atlantic cable.'

With two unprotected wires sunk in the sea, it would be possible to send signals, because a large part of the battery-current would naturally travel through the wire instead of dispersing itself in the water. For practical work, further experiments are required; but these experiments are going on, and when once the remaining difficulties are overcome, it will be possible to establish a cheap system of international telegraphy, and send messages at very low cost to any part of the world.

Mr M. F. Maury, who was formerly director of the observatory at Washington, and is well known by his work on the *Physical Geography of the Sea*, has delivered an address to the National Agricultural Congress at St Louis, and in other places, on a grand scheme in which meteorologists and agriculturists all over the world are to co-operate. Meteorology, he says, becomes more and more scientific, and in course of time it will be as easy to predict ordinary weather, as it now is to foretell the gales and storms of which warnings are so frequently given by the Meteorological Office. In order that prediction may be trustworthy, the system of observation of the weather must be universal; and as Mr Maury thinks, no better way could be devised than a co-operation of all the farmers and all the meteorologists of all countries in the work. He would invite all nations to join in a conference to agree upon a method of observation; and when the observations are begun, they should at once be communicated from country to country by telegraph, or otherwise. The condition of crops is to be communicated, as well as the state of the weather: hence, every farmer will be able to judge for himself as regards supplies of

produce, and probabilities of the market, and will consequently not be so much at the mercy of dealers and speculators as at present. If it be desirable to send out expeditions to explore the bottom of the deep sea, how much more desirable is it to discover all the movements of our great atmospheric ocean, and the laws by which they are regulated. The congress above named have passed a series of resolutions approving Mr Maury's project, and have appointed a committee to urge it upon the attention of the United States' government, and take such other steps as may be expedient.

It might be thought impossible to say anything new about the alphabet, yet Mr J. Evans, F.R.S. has delivered a lecture thereupon at the Royal Institution, and shewn reason for holding with those philologists who find the origin of the A B C in pictorial representations. That the alphabet at present in use in Europe came to us from a Phœnician source, seems pretty certain; and the Greeks with their mythical Cadmus have perhaps preserved an allusion to Kedom, which, in Semitic phrase, means the East. The time at which it came may be approximately determined by the Moabite Stone, about which we have heard so much of late. The date assigned to that stone is 900 B.C. and the form of the letters carved thereon corresponds with that of the oldest Greek letters known to scholars. Hence, there is a strong presumption in favour of letters having been imported into Greece at the time when the Phœnician alphabet was in that stage of development in which it occurs on the stone.

Mr Evans is of opinion that the Phœnician alphabet here referred to is 'not removed by many centuries from the time when the letters were merely delineations of objects,' and he endeavours to make out the stage of culture to which the inventors of that alphabet had arrived. 'They were not,' he says, 'mere nomads or hunters, but a people with fixed dwellings for themselves, and inclosures for their cattle. They were acquainted with agriculture, and had domesticated animals, and employed the ox as a beast of draught to cultivate fields, the produce of which they reaped with metallic sickles.' In fact, their civilisation would seem to have been at least equal to that of the bronze-using people of the Swiss lake-dwellings.

The particulars concerning railways for the year 1871, just published by the Board of Trade, may be regarded as amazing. At the end of that year, the total length of railways in the United Kingdom was 15,376 miles, and the capital raised by the companies to whom the several lines belonged amounted to L552,680,107! The number of miles

travelled by trains in the course of the year was 179,075,894, and the number of passengers carried by those trains was 375,220,754, of whom, in round numbers, 31,000,000 were in Scotland, 15,500,000 in Ireland, and all the others in England. We are shocked at times with reports of fatal accidents with details of killed and wounded; but when compared with the prodigious numbers that travel harmless, the casualties sink into insignificance. The receipts of the year amounted to L25,739,920 for passengers, and L26,484,978 for goods; and of this large sum, nearly one half was spent in paying the working expenses. Less than a tenth of the whole number of passengers travelled first class, more than a fifth second class, and nearly seven-tenths third class. From these particulars, we see that the traffic of the country at large has reached a stage of development almost incredible; and when the returns for the present year come to be published, we shall doubtless see that introduction of third-class carriages into all trains will shew a significant increase in the item of receipts from third-class passengers.

THE WINTER TREE.

I saw it late in July—then it towered,
Like a well-laden ship, the merchant's hope;
A thrush rose piping on its mast-like top,
Viewing his neighbouring nest in ivy bowered.
Hither, by burning noon-day overpowered,
The kine came sauntering from the grassy slope,
And dreamy stood beneath the leafy cope,
Or placid, on the shadowy carpet, cowered;
But songless, leafless, kine-forsaken now,
Torn by November's desolating gale,
It seems a standard ship without a sail,
That soon to earth in wreck forlorn must bow!
'Nay!' sings prophetic Spring, 'that shall not be;
I come to bloom with joy that winter tree.'

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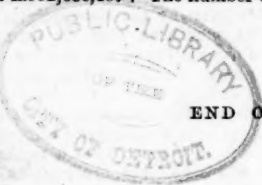
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